

23 May, 2001

MODIS sensor Working Group (MsWG) Summary

Attendance: Bill Barnes, Chris Moeller, Ed Zalewski, Eddie Kearns, Eric Vermote, Gary Toller, Jack Xiong, Roger Drake, Steve Platnick, Vince Salomonson, Zhengming Wan, Gwyn Fireman

Erratum for May 16: The 2nd item under **Moeller** says "...seen in Band 26 even when there is dense cloud cover." This should read "...seen in Band 26 even when atmospheric water vapor content is large".

Scheduled Items

Aqua MODIS (FM1) B1 and B2 gain decrease

Roger Drake reported SBRS's findings.

- SBRS has trended MODIS performance at various points, including at spacecraft integration and comprehensive performance tests at TRW. Tests include SRCA spatial collects, ecal, and RMS noise to characterize system performance, signal response for detector functionality, peak of line-spread function.
- Performance was very consistent in all tests until the end of March, during the dry run of systems CPT. At that time radiometric response of Bands 1 and 2 had decreased by 8 or 9% from previous history, for all detectors, for both electronics sides.
- Each factor affecting the signal was considered separately:
- No SRCA lamp color temperature shift observed, since other bands with comparable wavelength were not affected.
- No SRCA lamp radiance changes observed. Band 1 is trended with 30W lamps and Band 2 with 10W lamps.
- SRCA SNR is not implicated, as other bands trended with 30W lamps do not show the same effect.
- No spectral shifts were observed in the intervening optics.
- SRCA spectral RSR tests show center wavelength is consistent with earlier tests to within 1 nm for Band 1, 0.5 nm for Band 2.
- Ecal tests show no anomalies in other bands.

- All 4 SF in Bands 1 and 2 exhibit the same behavior, with no variations in gain between them.
- Bands 1 and 2 trend together; how do their characteristics compare?
- Each has separate analog electronics and A/D converter; other bands on VIS/NIR FPA share analog electronics and ADC.
- Common filter substrate, same readout timing, same biasing on focal plane readout.
- SBRS is looking at PFM pre-flight data; there aren't nearly as many spatial collects.
- MCST's analysis of on-orbit data shows no comparable instability.
- History shows two events of about 5% change each; these correlate with hysteresis tests. The instrument temperature was changed from -7 to $+16$ degrees C, at a rate of 3 degrees/hour.
- Gains are programmable, so we should be able to recover the desired dynamic range.
- Last Friday SBRS completed focal plane bias sweeps in ITWK only (VDET is fixed at 15V). ITWK sweeps show no anomalies in Band 1 and 2.
- No solutions have been found, and no more tests are planned for the near future.

Terra MODIS data loss due to latest SSR (Solid State Recorder) anomaly

- Anomaly first occurred last Sunday evening; “uncorrectable” data persists, resulting in a 5 – 10% data loss.
- MODIS data processing is on hold; EDOS cannot process “uncorrectable” data. Vince Salomonson has heard that some people are receiving data, and will pursue the issue at the PIP meeting.
- Eric Vermote reports that he has seen affected MODIS data obtained from NOAA. Data is missing in “chunks”, not scattered throughout a granule, so it may be possible to recover some data within affected granules.
- Once the anomaly is fully understood, affected memory locations might be mapped out and avoided.

Around the Table

Platnick:

Q: Has SBRS spoken with detector people about SRCA negative excursions?

A: No; too busy with FM-1 Band 1 & 2 issue.

Xiong:

- MCST staff met with Vermote and Platnick on Tuesday to discuss SRCA crosstalk analysis. Moeller sent Band 26 crosstalk charts. As reported in an email to Moeller, there is not obvious correlation between Band 7 raw signal and Band 26 striping. MCST will come back to the issue at a later date.
- MCST is developing a research version of L1B capable of implementing new crosstalk corrections.
- MCST is getting ready for FM-1 T/V analysis to address both TEB and RSB issues, and will need to consult SBRS regarding test procedures and parameters.
- MCST continues to trend RSB degradation to make sure the implemented linear fit remains appropriate with time.

Wan:

- Requests to be kept informed on SRCA test status.

Moeller:

- Has been comparing Bands 7 and 26. Band 7 crosstalk does not explain all surface features seen in Band 26.
- Moeller is using the same RSR as MCST, which is cut off at the 1% response level. There is concern that channel-to-channel differences in out-of-band response could be another factor in Band 26 striping.

Kearns:

- Working on empirical correction to striping. Preparing for production, making changes in code to implement mirror side dependence as a function of position. With this empirical approach, Miami aims to recover more data near the glint pattern.
- In the global SST map Miami is developing, it is evident that some detectors show more random noise than others do. Noise is especially apparent in the SST product, derived from 4-micron band differences and ratios. The effect is compounded when the same detector drifts in opposite directions in different bands. Noise is still within instrument specs. Miami is applying a 3x3 median filter to minimize impact.

No new Action Items resulted from this meeting.

compiled by G. Fireman 24 May, 2001